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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/798,967

03/12/2004

Kwong-Kit Choi

ARL 03-56

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07/26/2006

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EXAMINER

ZETTL, MARY E

ART UNIT

PAPER NUMBER

2875

DATE MAILED: 07/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/798,967

Applicant(s)

CHOI, KWONG-KIT

Examiner

Mary Zettl

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-21 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12 March 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 12, 13, 15, and 16, are rejected under 35 U.S.C. 102(b) as being anticipated by Choi (US 5,384,469 A).

Regarding claims 12 and 13, Choi discloses a voltage-tunable multicolor infrared (IR) detector element (Abstract) comprising: a substantially planar surface (22) adapted to admit light; and a means for redirecting the admitted light (redirect light into superlattice structure; col. 3, lines 60-65). Choi further discloses sides extending from the substantially planar surface, each side (sides of item 24) being substantially non-perpendicular to the substantially planar surface.

Regarding claims 15 and 16, Choi discloses a first and second superlattice of quantum wells each adapted to detect respectively a first and second range of wavelengths (col. 4, lines 37-40).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10 and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. *Two-color corrugated quantum-well infrared photodetector for remote temperature sensing*.

Regarding claims 1, 2, 4, 7, 9, 17, 18, and 20, Chen et al. teach a tunable voltage source (page 7, paragraph 1 and page 8 changing voltages from 0.85 V to 3.5 V to -3V) adapted to supply a positive and negative bias voltage; top contact and bottom contact (Figure 1 (b)); substantially-transparent substrate (Figure 1(b)) matrix of detectors (Figure 1 (a)), each detector comprising bottom surfaces and side surfaces with each side being substantially non-parallel to an opposing side and each surface capable of reflecting incident radiation (Figure 1(b); and a first and second wavelength QWIP (page 7, paragraph 2) adapted to detect energy at first and second wavelengths (page 7, paragraph 2).

Regarding claim 3, Chen et al. do not disclose expressly the structures being superlattices however it would have been well-known to one of ordinary skill in the art that it was conventional for QWIPs to be superlattices.

Regarding claims 5, 6, 19, and 21 Chen et al. further teach concurrently displaying the first and second wavelength two-dimensional image (Figure 3).

Regarding claim 8, Chen et al. do not disclose expressly the contacts being metal contacts, however it would have been obvious to one of ordinary skill in the art

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that in order to efficiently conduct electricity it would have been necessary for the contacts to have been made out of metal.

Regarding claim 10, Chen et al. further teach the first and second wavelength QWIP elements adapted to detect energy at first and second wavelengths (page 7, paragraph 2) and the first and second quantum wells separated by a blocking barrier (page 7, last paragraph second col.).

3. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Choi (US 5,384,469 A) in view of Chen et al. *Two-color corrugated quantum-well infrared photodetector for remote temperature sensing*.

Regarding claim 14, Choi et al. do not show expressly each side being substantially non-planar to an opposing side, however it would have been obvious to one of ordinary skill in the art that a pattern of oppositely slanting sides as taught by Chen et al. would have been included in the invention of Choi et al. such that the emitted light was effectively coupled.

Allowable Subject Matter

4. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 11, prior art fails to teach or make obvious a QWIP element with an energy relaxation layer interposed between a first superlattice of quantum wells and a second superlattice of quantum wells.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kuan et al. (US 2004/01878421) teach a voltage tunable multi-color superlattice infrared photodetector (Abstract).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Zettl whose telephone number is (571) 272-6007. The examiner can normally be reached on M-F 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Renee Luebke can be reached on (571) 272-2009. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



MZ



RENEE LUEBKE
PRIMARY EXAMINER